

IN THE CLAIMS

1. (Currently Amended) A constrained multipath routing method in a Multi-Protocol Label Switching (MPLS) network, comprising the steps of:

- a) setting MPLS network conditions and traffic requirements assigned to each link;
- b) calculating the amount of assignments of each traffic requirement assigned to each link and a minimum value of each maximum link utilization  $\alpha$ ;
- c) calculating a traffic rate ( $X_{ij}^{ki}$ ) in which the degree of network resource utilization is minimized in the minimized maximum link utilization  $\alpha$  using the calculated amount of assignments of each traffic requirement and which is assigned to each link; and
- d) calculating multiple paths corresponding to the input traffic requirements and traffic division ratios of the multiple paths using the calculated traffic rate and a traffic corresponding to the traffic rate of each path satisfies a restrictive condition of maximum allowable hop count; and

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~~e) selecting a path which satisfies the restrictive condition of maximum allowable hop count.~~  
*Setting a multipath*

2. (Original) The constrained multipath routing method according to claim 1, wherein the step d) includes the step e) of dividing input traffic into multiple classes for the calculated multiple paths according to the traffic division ratio.

3. (Original) The constrained multipath routing method according to claim 1, wherein in the step b) the minimum value of the maximum link utilization of each link is calculated by applying a mathematical modeling method by using a mixed integer programming (MIP).

4. (Original) The constrained multipath routing method according to claim 1, wherein in the step c) the traffic rate is calculated by applying a mathematical modeling method by using a mixed integer programming (MIP).

5. (Cancelled)

6. (Cancelled)

7. (Currently Amended) The constrained multipath routing method according to claim 611, wherein the discrete traffic division ratio has a discrete value between 0 and 1.

8. (Original) The constrained multipath routing method according to claim 1, wherein the method calculates multiple paths additionally including a specific node/link and a traffic division ratio of each path.

9. (Original) The constrained multipath routing method according to claim 1, wherein the method calculates multiple paths excluding a specific node/link and a traffic division ratio of each path.

10. (Currently Amended) A computer-readable record medium for recording a program in a Multi-Protocol Label Switching (MPLS) network, the program executing the functions of:

- a) setting MPLS network conditions and traffic engineering requirements assigned to each link;
- b) calculating the amount of assignments of each traffic requirement assigned to each link and a minimum value of each maximum link utilization;
- c) calculating a traffic rate in which resource utilization is minimized in the minimized maximum link utilization using the calculated amount of assignments of each traffic requirement and which is assigned to each link; and

d) calculating multiple paths corresponding to each traffic requirement and traffic division ratios of the multiple paths using the calculated traffic ratios and a traffic corresponding to the traffic rate of each path is calculated by applying a discrete traffic division ratio; and

~~e) selecting a path which satisfies the discrete traffic division ratio.~~

*setting a multipath*

11. (Currently Amended) A constrained multipath routing method in a Multi-Protocol Label Switching (MPLS) network, comprising the steps of:

- a) setting MPLS network conditions and traffic requirements assigned to each link;
- b) calculating the amount of assignments of each traffic requirement assigned to each link and a minimum value of each maximum link utilization  $\alpha$ ;
- c) calculating a traffic rate ( $X_{ij}^{kl}$ ) in which the degree of network resource utilization is minimized in the minimized maximum link utilization  $\alpha$  using the calculated amount of assignments of each traffic requirement and which is assigned

to each link; and

d) calculating multiple paths corresponding to the input traffic requirements and traffic division ratios of the multiple paths using the calculated traffic rate and a traffic corresponding to the traffic rate of each path is calculated by applying a discrete traffic division ratio; and

~~e) selecting a path which satisfies the discrete traffic division ratio.~~

*setting a multipath*

12. (Previously Presented) The constrained multipath routing method according to claim 11, wherein the step d) includes the step e) of dividing input traffic into multiple classes for the calculated multiple paths according to the traffic division ratio.

13. (Previously Presented) The constrained multipath routing method according to claim 11, wherein in the step b) the minimum value of the maximum link utilization of each link is calculated by applying a mathematical modeling method by using a mixed integer programming (MIP).

14. (Previously Presented) The constrained multipath routing method according to claim 11, wherein in the step c) the traffic rate is calculated by applying a mathematical modeling method by using a mixed integer programming (MIP).

15. (Previously Presented) The constrained multipath routing method according to claim 11, wherein the method calculates multiple paths additionally including a specific node/link and a traffic division ratio of each path.

16. (Previously Presented) The constrained multipath routing method according to claim 11, wherein the method calculates multiple paths excluding a specific node/link and a traffic division ratio of each path.

17. (Cancelled)